IMAGE FORMING DEVICE

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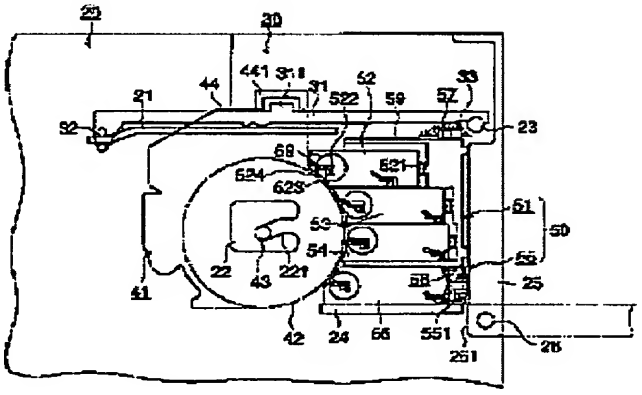
Abstract of **JP11038721**

PROBLEM TO BE SOLVED: To easily replace a first and a second developing means without providing a support base by concurrently extracting the second developing means by the action of a coupling means when the first developing means is extracted, and supporting the first developing means with the second developing means in the state. SOLUTION: When a developing door 25 is opened and a second hook lever is rotated to this side, a second coupling pin is lowered, and the coupling between the second coupling pin provided on a first developing means 51 and the groove 33 of a second device main body 30 is released. The second hook lever is held and pulled to the front side of a device, and the hanging member of the first developing means 51 is extracted along a guide groove. Since the front coupling pin is coupled with a groove provided on the first developing means 51, a second developing means 55 is extracted concurrently with the extraction of the first developing means 51. The hanging member of the first developing means 51 is released from the guide groove at the final stage of the extraction, and the second developing means 55 is supported on a support face 251 of the developing door 25. When only the first developing means 51 is lifted, the first coupling pin is released from the groove of the first developing means 51, and only the first developing means 51 is lifted.



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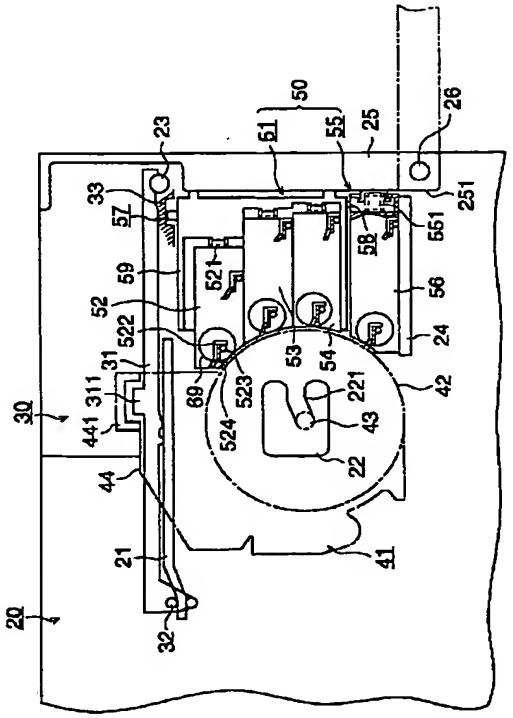
(54)【発明の名称】　画像形成装置

(57)【要約】
【課題】　装置本体に対し引出し可能な重量の重い現像手段を引き出した状態で支持台を別途に設けることなく支持して、容易に交換できる画像形成装置。
【解決手段】　少なくとも、静電潜像を形成する像担持体と、前記像担持体に形成された静電潜像を現像剤により顕像化する複数の現像手段とを有する画像形成装置であって、前記画像形成装置は、甲現像手段と、前記甲現像手段の下部に設置された乙現像手段と、前記甲現像手段と前記乙現像手段とを係合する係合手段とを有し、前記甲現像手段は前記画像形成装置に対して引出し可能であり、前記甲現像手段を引き出す際に前記係合手段の作用により前記乙現像手段が同時に引き出され、前記甲現像手段が引き出された状態で前記甲現像手段を前記乙現像手段が支持することを特徴とする画像形成装置である。



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【特許請求の範囲】

【請求項１】　少なくとも、静電潜像を形成する像担持体と、前記像担持体に形成された静電潜像を現像剤により顕像化する複数の現像手段とを有する画像形成装置において、甲現像手段と、前記甲現像手段の下部に設置された乙現像手段と、前記甲現像手段と前記乙現像手段とを係合する係合手段とを有し、前記甲現像手段は前記画像形成装置に対して引出し可能であり、前記甲現像手段を引き出す際に前記係合手段の作用により前記乙現像手段が同時に引き出され、前記甲現像手段が引き出された状態で前記甲現像手段を前記乙現像手段が支持することを特徴とする画像形成装置。

【請求項２】　前記係合手段の作用を解除することにより、前記乙現像手段のみを引き出すことが可能であることを特徴とする請求項１記載の画像形成装置。

【請求項３】　前記甲現像手段又は前記乙現像手段を引き出す際に装置本体に設置された現像扉を開放し、前記乙現像手段が引き出された状態では、前記現像扉が前記乙現像手段を支持することを特徴とする請求項１または請求項２に記載の画像形成装置。

【請求項４】　前記甲現像手段及び前記乙現像手段は前記画像形成装置に対して、前記画像形成装置の操作部が設置された装置前面側に引出し可能であることを特徴とする請求項１、２または３に記載の画像形成装置。

【請求項５】　少なくとも、静電潜像を形成する像担持体と、前記像担持体に形成された静電潜像を現像剤により顕像化する複数の現像手段とを有する画像形成装置において、駆動源が設置された第１装置本体と、第１装置本体に対して引出し可能である第２装置本体と、前記複数の現像手段における甲現像手段と、前記複数の現像手段における乙現像手段と、前記甲現像手段と前記乙現像手段とを係合する甲係合手段と、前記第２装置本体と前記甲現像手段を係合する乙係合手段とを備え、前記甲現像手段と乙現像手段は、前記第２装置本体が前記第１装置本体に対して引き出されていない状態では、前記第１装置本体に設けられた支持部より支持されており、前記第２装置本体を前記第１装置本体に対して引き出す際に、前記甲係合手段及び乙係合手段の作用により前記支持部による支持が解除され、前記甲現像手段及び前記乙現像手段が同時に引き出されることを特徴とする画像形成装置。

【請求項６】　前記画像形成装置には現像扉が設置されており、前記第２装置本体を前記第１装置本体に対して引き出す際に、前記現像扉を開放し、前記第２装置本体を前記第１装置本体に対して引き出された状態で、前記現像扉が前記甲現像手段及び乙現像手段を支持することを特徴とする請求項５に記載の画像形成装置。

【請求項７】　前記像担持体は前記第２装置本体が前記第１装置本体に対して引き出されていない状態で、前記第１装置本体に支持されており、前記第２装置本体を前記第１装置本体に対して引き出す際に、前記第２装置本体に支持され引き出されることを特徴とする請求項５または６に記載の画像形成装置。

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【請求項８】　前記第２装置本体は前記第１装置本体に対して前記画像形成装置の操作部が設置された装置前面側に引出し可能であることを特徴とする請求項５、６または７に記載の画像形成装置。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は画像形成装置に係わり、さらに詳しくは、少なくとも、静電潜像を形成する像担持体と像担持体に形成された静電潜像を現像剤により顕像化する現像手段を有する画像形成装置に関する。

【０００２】

【従来の技術】

（従来の技術１）画像形成装置に使用される現像手段のライフサイクルは、一般的に画像形成装置のライフサイクルに比べ短いので、現像手段を所定時間使用したら交換しなければならない。従って、現像手段の交換を考慮し、最も容易に行えるよう画像形成装置の構造を決定する必要があり、多種の交換が考えられていた。

【０００３】（従来の技術２）装置内部に発生した紙詰まりの処理や現像手段のコンシューマブル交換を容易にするために、画像形成装置の転写部等を開放できるものが知られている。

【０００４】

【発明が解決しようとする課題】しかしながら、（従来の技術１）の課題として、画像形成装置のうち、上から順にイエロー、マゼンタ、シアン、ブラックの現像手段が並列して設置しているカラー画像形成装置を考えてみると、イエロー、マゼンタ現像手段等はブラックの現像手段と比べて使用頻度が低く、ほぼライフサイクルが同一であるために一つのユニットとして構成し（以下カラー現像ユニットという）、一体的に交換するものがある。

【０００５】カラー現像ユニットはかなりの重量を有し、交換する際はカラー現像ユニットの上部を持つような構造にしなければ、安定した力でカラー現像ユニットを持ち、交換作業を行うことが出来ない。従って、カラー現像ユニットを交換する際はカラー現像ユニットの上部を持てるように開放する画像形成装置が考えられるが、設置されたカラー現像ユニットの上には原稿台やトナー補給ユニット等が設置されているものが多く、原稿台は装置本体に対する精度が必要であったり、トナー補給ユニット等がトナーがこぼれる等の理由により、カラー現像ユニットの上部を持てるように構成する構造は好ましくない。

【０００６】そこで、カラー現像ユニット等の現像手段を装置手前側に引き出して交換するものが、交換作業の容易性、装置の構造上好ましいが、カラー現像ユニット

の上部を持って交換作業を行うために、引き出した位置でカラー現像ユニットを支持しなければならない。カラー現像ユニット等を引き出した位置で支持する支持台を設置することが考えられるが、別途、支持台を装置本体に設けると装置が大型化を招き、好ましくない。

【０００７】（従来の技術２）の課題として、転写部等を開放するため、第２装置本体を本体主要部をなす第１装置本体に対して引き出し、２分割可能な画像形成装置が知られている（特願平６－２７７９７８号公報等）。画像形成装置の内部構造を考えてみると、現像手段、像担持体等の駆動源は電気部品であるので、配線等を考慮し電源が配置されている第１装置本体に設置することが望ましい。一方、像担持体、現像手段は、転写部等を開放するために第２装置本体とともに引き出されることが望ましい。

【０００８】しかし、像担持体は駆動源からの駆動力を安定して供給してもらい、回転ムラを最小限に抑え良好な画像形成を行う必要があるので、第２装置本体を第１装置本体にセットした状態では、駆動源は設置されている第１装置本体に支持され、駆動源との距離を正確に設定することが望ましい。

【０００９】また、像担持体との微妙な位置精度が必要な現像手段も同じく第２装置本体を第１装置本体にセットした状態では第１装置本体に支持され、駆動源、像担持体との距離を正確に設定することが望ましい。このように、第１装置本体に支持された現像手段を第２装置本体とともに引き出すために、装置の大型化を招かず、且つ操作が容易な構造の画像形成装置が望まれていた。

【００１０】本発明は上記の課題に鑑みなされたもので、第１の目的として、重量の重い現像手段を引き出した状態で支持するために、支持台を別途に設けることなく、容易に交換できる画像形成装置を提供することにある。第２の目的として、第２装置本体の引出し装置に連動して複数の現像手段を引出し、画像形成装置の転写部等を大きく開放し、紙詰まりの処理や現像手段等のコンシューマブル交換を容易にできる画像形成装置を提供することにある。

【００１１】

【課題を解決するための手段】上記の目的は下記のような手段により達成される。

【００１２】（１）少なくとも、静電潜像を形成する像担持体と、前記像担持体に形成された静電潜像を現像剤により顕像化する複数の現像手段とを有する画像形成装置において、甲現像手段と、前記甲現像手段の下部に設置された乙現像手段と、前記甲現像手段と前記乙現像手段とを係合する係合手段とを有し、前記甲現像手段は前記画像形成装置に対して引出し可能であり、前記甲現像手段を引き出す際に前記係合手段の作用により前記乙現像手段が同時に引き出され、前記甲現像手段が引き出された状態で前記甲現像手段を前記乙現像手段が支持することを特徴とする画像形成装置。

【００１３】または、（２）少なくとも、静電潜像を形成する像担持体と、前記像担持体に形成された静電潜像を現像剤により顕像化する複数の現像手段とを有する画像形成装置において、駆動源が設置された第１装置本体と、第１装置本体に対して引出し可能である第２装置本体と、前記複数の現像手段における甲現像手段と、前記複数の現像手段における乙現像手段と、前記甲現像手段と前記乙現像手段とを係合する甲係合手段と、前記第２装置本体と前記甲現像手段を係合する乙係合手段とを備え、前記甲現像手段と乙現像手段は、前記第２装置本体が前記第１装置本体に対して引き出されていない状態では、前記第１装置本体に設けられた支持部より支持されており、前記第２装置本体を前記第１装置本体に対して引き出す際に、前記甲係合手段及び乙係合手段の作用により前記支持部による支持が解除され、前記甲現像手段及び前記乙現像手段が同時に引き出されることを特徴とする画像形成装置である。

【００１４】

【発明の実施の形態】本発明の実施形態の説明に先立ち、本発明の画像形成装置の採用に適した装置を説明する。図１は本発明の画像形成装置の採用に適した装置の側面図で、さらに詳しくは、画像形成装置であるカラープリンタの側面図である。

【００１５】このカラープリンタは、像担持体に順次形成される各色トナー像を重ね合わせた後に、転写部で転写紙Ｐ上に１回で転写してカラー画像を形成し、その後に、分離手段により像形成面から剥離する方式のカラー画像形成装置である。

【００１６】図で、像担持体４２は感光体ドラムで、ＯＰＣ感光体をドラム基体に塗布形成したものである。スコロトロン帯電器６１は感光体ドラムの周面に対し高電位の一様な帯電をグリッド電位に保持されたグリッドとコロナ放電ワイヤによってあたえられる。感光体ドラムへの一様帯電の後に、像露光手段６３により画像信号に基づく像露光が行われる。像露光手段６３は図示しないレーザーダイオードを発光光源として回転するポリゴンミラー６４、ｆθレンズ６５、シリンドリカルレンズ６６を経て反射ミラー６７により光路を曲げられ主走査がなされるもので、感光体ドラムの回転により潜像が形成される。感光体ドラム４２の周縁には、イエロー（Ｙ）、マゼンタ（Ｍ）、シアン（Ｃ）、黒色（Ｋ）のトナーとキャリアとからなり２成分現像剤をそれぞれ内蔵したＹ現像器５２、Ｍ現像器５３、Ｃ現像器５４、Ｋ現像器５６がある。

【００１７】先ず、１色目のイエローの現像がマグネットを内蔵し、現像剤を保持して回転する現像剤担持体である現像スリーブによって行われる。現像剤はキャリアとトナーからなっている。現像剤は現像スリーブ６９上に所定の現像剤層厚に規制されて現像域へと搬送され

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る。現像域に於ける現像スリーブ６９と像担持体４２との間隔は現像剤層厚より大きい所定の大きさに保持される。

【００１８】１色目の顕像化が終わった後に、２色面のマゼンタの画像形成工程に入る。さらにシアン、黒についても同様の画像形成が行われ、感光体ドラム上に４色の顕像が形成される。一方、給紙カセット７２より半月ローラ７０を介して排出された１枚の転写紙Ｐは給紙ローラ７１を経てレジストローラ７４の近傍で一旦停止し、転写のタイミングの整った時点でレジストローラ７４の回転作動により転写域へと給紙される。

【００１９】転写域においては転写のタイミングに同期して感光体ドラム４２の周面に転写手段６２が圧接され、給紙された転写紙Ｐに多色像が一括して転写される。次いで、転写紙Ｐは感光体ドラムの周面より分離して定着装置７６に搬送される。そして加熱、加圧によりトナーを溶着した後に、排紙ローラ７７を経て装置外部の排紙トレイ７８に排出される。一方、転写紙Ｐを分離した感光体ドラム４２は、除電器により除電を受けた後に、クリーニング装置７９のブレードの圧接により残留トナーを除去し、再度除電とスコロトロン帯電器６１による帯電を受けて次のプロセスに入る。

【００２０】次に、本発明の画像形成装置の実施形態を説明するがこれに限定されるものではない。図２は実施形態の画像形成装置の側面図で、図３は実施形態の画像形成装置の甲現像手段、乙現像手段の斜視図で、さらに詳しくは図３（ａ）は甲現像手段、乙現像手段が画像形成装置に収納されている状態、図３（ｂ）は甲現像手段、乙現像手段が画像形成装置より引き出されている状態、図３（ｃ）、（ｄ）は乙係合手段の作動説明図である。図４は実施形態の甲現像手段、乙現像手段の前面図で、図５は実施形態の画像形成装置より甲現像手段、乙現像手段が引出された状態の側面図で、図６は実施形態の画像形成装置より第２装置本体、現像手段、感光体ドラムユニットが引出された状態の側面図である。

【００２１】図２、３、４で、画像形成装置は第１装置本体２０と第２装置本体３０で構成されている。第１装置本体２０は現像手段５０を駆動する図示しない駆動源、第１装置本体レール２１、ローラ２３、現像扉２５、支持板２４等を有している。

【００２２】第１装置本体レール２１は第２装置本体３０を引き出すときの案内となるレールで、レールに沿って、後述の第２装置本体アーム３１が移動するようになっている。また、ローラ２３は第２装置本体アーム３１の上を回転している。

【００２３】現像扉２５は軸２６で回動自在となっていて、第２装置本体３０を第１装置本体２０に対して引き出す際に開放するようになっている。第２装置本体３０を第１装置本体２０に対して引き出された状態で現像扉２５は甲現像手段５１と乙現像手段５５とが重なった状

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態で支持面２５１により支持する。また、乙現像手段５５が引き出された状態では、現像扉２５は乙現像手段５５を支持面２５１で支持する。また、第１装置本体２０に固定された支持板２２には溝２２１があり、溝２２１に像担持体４２の軸４３が係合し像担持体４２を支持している。

【００２４】次に、第２装置本体３０は、第１装置本体２０に対して画像形成装置の操作部が設置された前面側に略水平に分割して引出し可能となっている。第２装置本体３０には第２装置本体アーム３１、溝３３等が設けられている。

【００２５】前記第２装置本体アーム３１はローラ２３の上を移動し、さらに第２装置本体アーム３１に設けられたローラ３２が第１装置本体レール２１に沿って移動して第２装置本体３０は装置の前面側に引き出されるようになっている。また、第２装置本体アーム３１には感光体ドラムユニット４１を移動させるための突起３１１が設けられている。また、溝３３は第２装置本体３０に固定して設けられた溝で、後述する乙係合手段の乙係合ピン５７１が係合するようになっている。

【００２６】次に、現像手段５０は像担持体４２に形成された静電潜像を現像剤により顕像化する。また、現像手段５０は甲現像手段５１と前記甲現像手段の下部に設置された乙現像手段５５で構成されている。

【００２７】甲現像手段５１は現像器枠５９、Ｙ現像器５２、Ｍ現像器５３、Ｃ現像器５４及び乙係合手段５７で構成されている。現像器枠５９はＹ現像器５２、Ｍ現像器５３、Ｃ現像器５４及び乙係合手段５７等を有する枠である。甲現像手段５１はカラー用の現像器で、黒色現像器以外を一緒に交換できるようになっている。また、甲現像手段５１は第２装置本体３０に対して引き出されていない状態では、甲現像手段５１の吊り部材５１１が第２装置本体の案内溝８０に摺動可能に支持されている（図４）。

【００２８】現像器枠５９内のＹ現像器５２は、第１装置本体２０に設置されたＹ現像器支持部５２４がＹ現像突起上部５２２とＹ現像器突起下部５２３の間に挟まれることにより第１装置本体２０に支持されている。Ｙ現像器５２以外の各現像器も同様に第１装置本体に支持されている。

【００２９】前記乙係合手段５７は第２装置本体３０と甲現像手段５１とを結合及び分離できるようになっており、図３（ｃ）、（ｄ）に示すように甲現像手段５１に設けられた乙係合レバー５７２には乙係合ピン５７１が固着されている。また、乙係合ピン５７１は軸受部５７４に回動自在に係合して上下方向にも移動できるようになっている。乙係合ピン５７１の上部先端は第２装置本体３０の溝３３に係合するようになっている。圧縮バネ５７３は乙係合ピン５７１に入れられ組み込まれており、乙係合レバー５７２を下方に付勢している。また、

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甲現像手段５１にはＬ型の窪み５１３、５１４があり、乙係合レバー５７２が入るようになっている。また、乙係合ピン５７１の先端部が図３（ａ）のように突出している場合は、乙係合レバー５７２は窪み５１３側に入っており、一方、乙係合ピン５７１の先端部が図３（ｂ）のように突出していない場合は乙係合レバー５７２は窪み５１４側に入るようになっている。図３（ｃ）、（ｄ）に示すように乙係合レバー５７２を矢印５７５の方向に回動操作すると、乙係合レバー５７２はＬ型の窪み５１３より外れ、圧縮バネ５７３の付勢により矢印５７６の方向に移動する。すると乙係合ピン５７１が下降し、第２装置本体３０の溝３３（図２）より外れるようになっている。次に、乙係合ピン５７１の先端を突出させるには、乙係合レバー５７２を矢印５７６と反対方向に圧縮バネ５７３に抗して持ち上げ、さらに矢印５７５の方向と逆方向に回転させて窪み５１３に入れると乙係合ピン５７１の先端が突出した状態になり、さらに乙係合レバー５７２は窪み５１３で阻止され手をはなしても乙係合ピン５７１の先端が突出した状態を保つようになる。

【００３０】次に、乙現像手段５５は黒色現像剤のＫ現像器５６と甲係合手段５８等で構成されている。Ｋ現像器５６は黒色現像剤の消費量が他の現像剤の消費量に比べ多いため、単体で設けられている。

【００３１】甲係合手段５８は甲現像手段５１と乙現像手段５５を係合、分離できるようになっている。甲係合手段５８は前述の乙係合手段５７と機構的、機能的に同様で詳しい説明は省略する。甲係合ピン５８１は甲現像手段５１に設けられた溝５１２に係合、分離できるようになっている。

【００３２】次に、図６で感光体ドラムユニット４１は像担持体４２を有する着脱自在ユニットで、感光体ドラムユニット４１は支持板４４に像担持体４２が固定されており、像担持体４２は軸４３を中心に回転するようになっている。支持板４４には係止部４４１があり第２装置本体アーム３１の突起３１１に係合している。第２装置本体アーム３１が装置前面側に移動する際に、第２装置本体アーム３１に設けられた突起３１１が、前記係止部４４１を同方向に押すようになっている。また、支持板４４が移動すると、支持板４４に支持されている感光体ドラムユニット４１も同方向に移動するようになっている。第２装置本体３０が第１装置本体２０に対して引き出されていない状態では、感光体ドラムユニット４１は軸４３が第１装置本体３０の支持板２２に入り支持されている。また、第２装置本体３０を第１装置本体２０に対して引き出す際には、感光体ドラムユニット４１は係止部４４１が突起３１１で支持され引き出される。

【００３３】ここで、実際の各引出し動作についてそれぞれ説明をする。

【００３４】（Ａ）現像手段（甲、乙現像手段）５０の

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引出し動作

図３、５で現像扉２５を矢印２７の方向に開き、乙係止レバー５７２を手前に回転（図３で矢印５７５方向）させると、圧縮バネ５７３の付勢力により乙係合ピン５７１が下がる。すると、甲現像手段５１に設けられた乙係合ピン５７１と第２装置本体３０の溝３３との係合が解かれる。ここで、乙係止レバー５７２を把持して装置の前面側に引き、甲現像手段５１の吊り部材５１１を案内溝８０にそって引き出す。このとき、甲係合ピン５８１は甲現像手段５１に設けらた溝５１２に係合しているので、甲現像手段５１の引出しと同時に乙現像手段５５も引き出される。引き出しの最後に甲現像手段５１の吊り部材５１１が案内溝８０より外れ、現像扉２５の支持面２５１の上に甲現像手段５１は乙現像手段５５に重なるように置かれる。そして甲現像手段５１のみ持ち上げると、甲係合ピン５８１が甲現像手段５１の溝５１２から外れ甲現像手段５１のみ持ち上がる。

【００３５】（Ｂ）乙現像手段５５の引出し動作

図２、３で現像扉２５を開き、甲係止レバー５８２を乙係止レバー５７２と同様にして手前に回転させると、圧縮バネの付勢力により甲係合ピン５８１が下がる。すると、甲係合ピン５８１と甲現像手段５１の溝５１２（図４）との係合が解かれる。ここで、甲係止レバー５８２を把持して装置の前面側に現像扉２５の支持面２５１に摺動して引き出す。なお、甲現像手段５１は吊り部材５１１が案内溝８０に入り乙現像手段５５には荷重がかからない構造になっている。

【００３６】（Ｃ）第２装置本体３０と現像手段（甲、乙現像手段）５０の引出し動作

図６で、現像扉２５を矢印２７方向に開き、第２装置本体３０を装置前面側（矢印２８の方向）に引き出す。すると、第２装置本体３０と一体の第２装置本体アーム３１も装置前面側に引き出される。詳しくは、第２装置本体アーム３１はローラ２３の上を移動し、さらに第２装置本体アーム３１に設けられたローラ３２が第１装置本体レール２１に沿って回転して移動し、第２装置本体３０は装置前面側に引き出される。この時、第２装置本体が装置前面側に移動する際に、第２装置本体に固定されている溝３３も移動し、溝３３が乙係合ピン５７１を同方向に押す。すると、甲現像手段５１が移動し、甲現像手段５１が移動しすると、甲現像手段５１の溝５１２が甲係合ピン５８１を同方向に押し、乙現像手段５５も引き出され、そして、前記動作説明（Ａ）で記載のように現像扉２５の支持面２５１の上に支持される。

【００３７】また、現像器の支持に関しては、Ｙ現像器突起上部５２２とＹ現像器突起下部５２３が第１装置本体３０に設置されたＹ現像器支持部５２４から外れるので、Ｙ現像器５２の支持が解除される。Ｙ現像器５２以外の各々の現像器も同様に支持が解除される。

【００３８】（Ｄ）第２装置本体３０と感光体ドラムユ

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ニット４１の引出し動作

図６で、現像扉２５を矢印２７方向に開き、第２装置本体３０を装置前面側（矢印２８の方向）に引き出す。すると、第２装置本体３０と一体の第２装置本体アーム３１も装置前面側に引き出される。詳しくは、第２装置本体アーム３１はローラ２３の上を移動し、さらに第２装置本体アーム３１に設けられたローラ３２が第１装置本体レール２１に沿って回転して移動し、第２装置本体３０は装置前面側に引き出される。この時、第２装置本体アーム３１が装置前面側に移動する際に、第２装置本体アーム３１に設けられた突起３１１が、支持板４４に設けられた係止部４４１を同方向に押す。すると支持板４４が移動し、支持板４４に支持されている像担持体４２を有する感光体ドラムユニット４１も同方向に移動し引き出される。なお、感光体ドラムユニット４１は第２装置本体３０が第１装置本体２０に対して引き出されていない状態では、感光体ドラムユニット４１の軸４３が第１装置本体３０の支持板２２の溝２２１に入り支持されている。また、第２装置本体３０を第１装置本体２０に対して引き出す際には、感光体ドラムユニット４１は感光体ドラムユニット４１の設けられた係止部４４１が突起３１１で支持され引き出される。

【００３９】

【発明の効果】以上のように構成したので、下記のような効果を奏する。

【００４０】請求項１の発明によれば、現像手段が例えばカラー用の甲現像手段と、白黒用の乙現像手段とがあるとき、甲現像手段を引出すと、同時に乙現像手段も引き出すことができ、また、甲現像手段を支持する部材を新たに設置する必要がなく甲現像手段を支持でき、また、現像手段を把持しやすく交換が容易にできる。

【００４１】請求項２の発明によれば、複数の現像手段の内、乙現像手段のみを単独で引き出すことができ便利である。

【００４２】請求項３の発明によれば、乙現像手段は別途、支持台を装置本体に設ける必要がなく支持でき、構造が簡易でコスト低減化がはかれる。

【００４３】請求項４の発明によれば、画像形成装置の前面側に引出せるので交換作業が容易となる。

【００４４】請求項５の発明によれば、第１装置本体に支持された現像手段が第２装置本体とともに引き出すために、装置の大型化を招かず、且つ操作が容易な構造の画像形成装置になる。

【００４５】請求項６の発明によれば、別途、支持台を装置本体に設ける必要がなく構造簡易でコスト低減化ができる。

【００４６】請求項７の発明によれば、像担持体は駆動源からの駆動力を受けて回転ムラを最小限に抑え画像形成を行う必要があるので、第２装置本体を第１装置本体

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にセットした状態では、駆動源は設置されている第１装置本体に支持され、駆動源との距離を正確に設定できる。

【００４７】請求項８の発明によれば、画像形成装置の前面側に引出せるので交換作業が容易となる。

【図面の簡単な説明】

【図１】本発明の画像形成装置の採用に適した装置の側面図である。

【図２】実施形態の画像形成装置の側面図である。

【図３】実施形態の画像形成装置の甲現像手段、乙現像手段の斜視図である。

【図４】実施形態の甲現像手段、乙現像手段の前面図である。

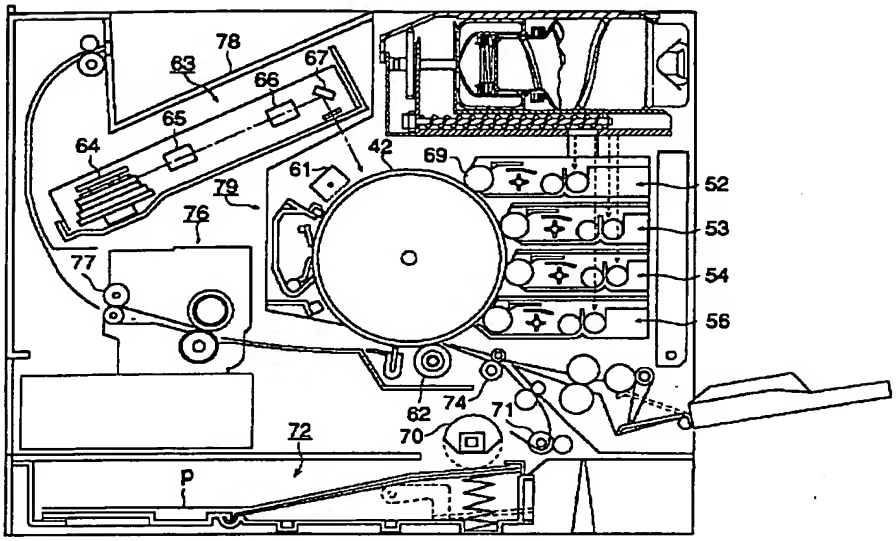
【図５】実施形態の画像形成装置より甲現像手段、乙現像手段が引出された状態の側面図である。

【図６】実施形態の画像形成装置より第２装置本体、現像手段、感光体ドラムユニットが引出された状態の側面図である。

【符号の説明】

２０　第１装置本体
２１　第１装置本体レール
２２１　溝
２２　支持板
２５　現像扉
２５１　支持面
２６　軸
３０　第２装置本体
３１　第２装置本体アーム
４１　感光体ドラムユニット
４２　像担持体
４４１　係止板
５０　現像手段
５１　甲現像手段（カラー現像ユニット）
５１１　吊り部材
５１２　溝
５２　Ｙ現像器
５２２　Ｙ現像器突起上部
５２３　Ｙ現像器突起下部
５２４　Ｙ現像器支持部
５３　Ｍ現像器
５４　Ｃ現像器
５５　乙現像手段
５６　Ｋ現像器
５７　乙係合手段
５７１　乙係合ピン
５７２　乙係止レバー
５８　甲係合手段
５８１　甲係合ピン
５８２　甲係止レバー

【図１】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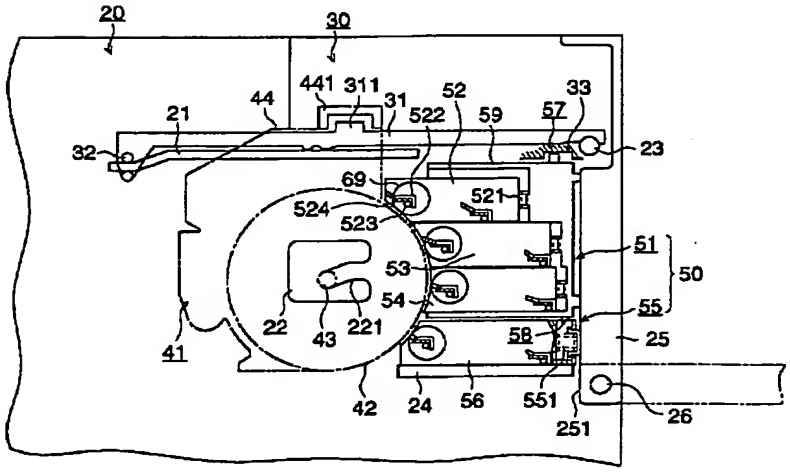
【図２】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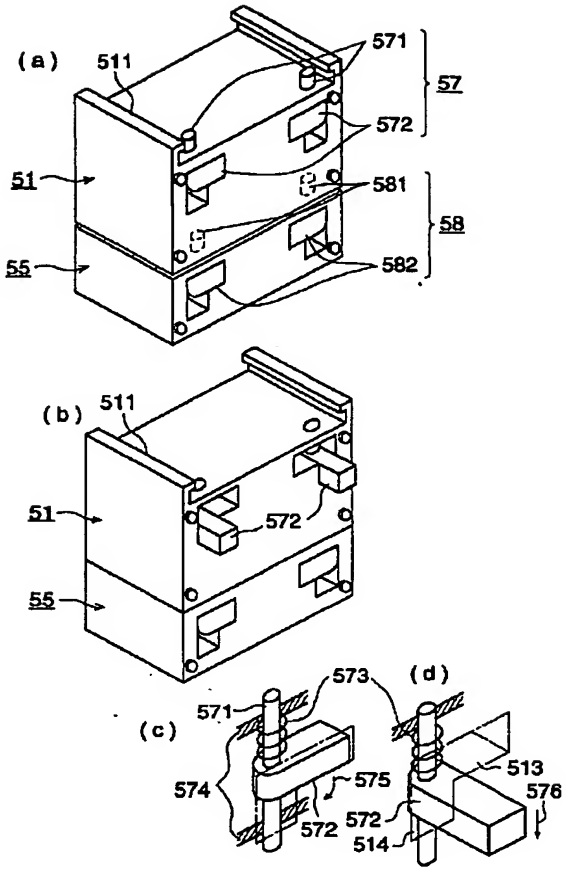
【図３】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(c)
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(d)
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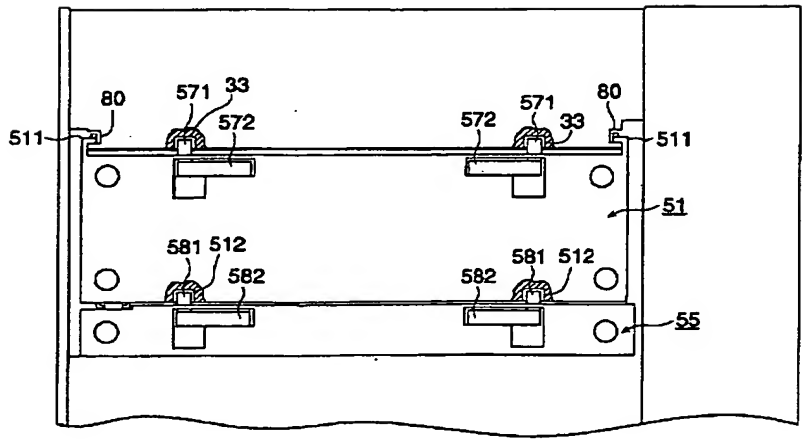
【図４】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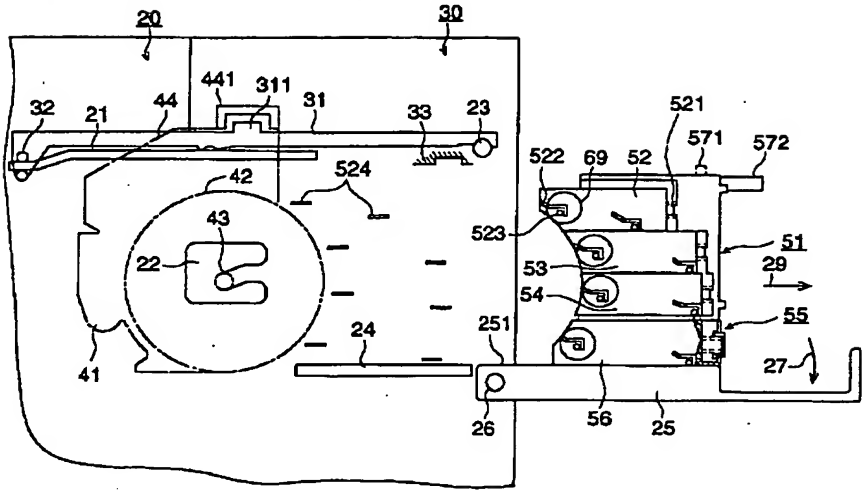
【図５】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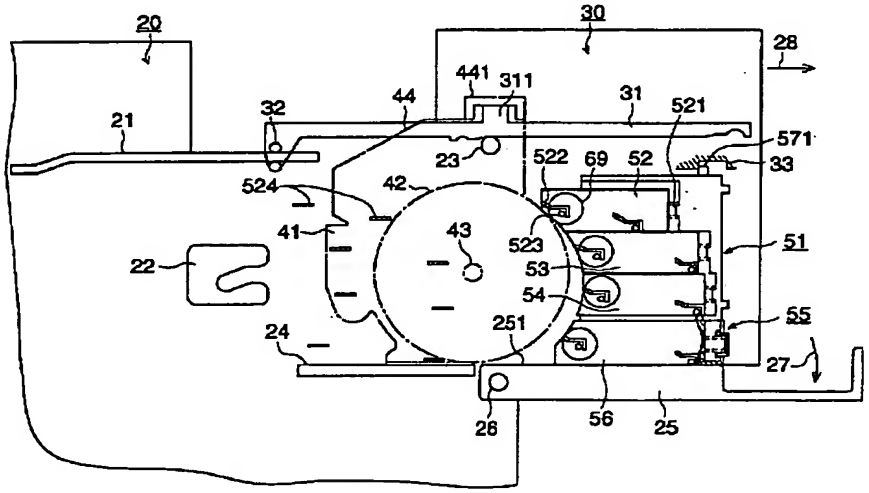
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PATENT ABSTRACTS OF JAPAN

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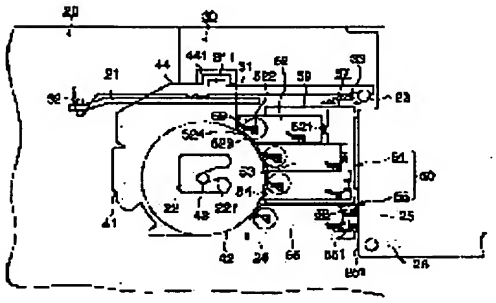
(54) IMAGE FORMING DEVICE

(57)Abstract:
PROBLEM TO BE SOLVED: To easily replace a first and a second developing means without providing a support base by concurrently extracting the second developing means by the action of a coupling means when the first developing means is extracted, and supporting the first developing means with the second developing means in the state.
SOLUTION: When a developing door 25 is opened and a second hook lever is rotated to this side, a second coupling pin is lowered, and the coupling between the second coupling pin provided on a first developing means 51 and the groove 33 of a second device main body 30 is released. The second hook lever is held and pulled to the front side of a device, and the hanging member of the first developing means 51 is extracted along a guide groove. Since the front coupling pin is coupled with a groove provided on the first developing means 51, a second developing means 55 is extracted concurrently with the extraction of the first developing means 51. The hanging member of the first developing means 51 is released from the guide groove at the final stage of the extraction, and the second developing means 55 is supported on a support face 251 of the developing door 25. When only the first developing means 51 is lifted, the first coupling pin is released from the groove of the first developing means 51, and only the first developing means 51 is lifted.



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* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] In the image formation equipment which has at least the image support which forms an electrostatic latent image, and two or more development means to develop with a developer the electrostatic latent image formed in said image support It has an engagement means by which a first development means, the second development means installed in the lower part of said first development means, and said first development means and said second development means are engaged. In case a cash drawer is possible for said first development means and it pulls out said first development means to said image formation equipment, said second development means is pulled out by coincidence according to an operation of said engagement means. Image formation equipment characterized by said second development means supporting said first development means where said first development means is pulled out.
[Claim 2] Image formation equipment according to claim 1 characterized by it being possible to pull out only said second development means by canceling an operation of said engagement means.
[Claim 3] Image formation equipment according to claim 1 or 2 characterized by said development door supporting said second development means where it opened wide the development door installed in the body of equipment when pulling out said first development means or said second development means, and said second development means is pulled out.
[Claim 4] Said first development means and said second development means are image formation equipment according to claim 1, 2, or 3 characterized by a cash drawer being possible at the front-face side of equipment in which the control unit of said image formation equipment was installed to said image formation equipment.
[Claim 5] In the image formation equipment which has at least the image support which forms an electrostatic latent image, and two or more development means to develop with a developer the electrostatic latent image formed in said image support As opposed to the body of the 1st equipment with which the driving source was installed, and the body of the 1st equipment The body of the 2nd equipment in which a cash drawer is possible, The first development means in said two or more development means, and the second development means in said two or more development means, It has a first engagement means by which said first development means and said second development means are engaged, and a second engagement means to engage said first development means with said body of the 2nd equipment. Said first development means and a second development means In the condition that said body of the 2nd equipment is not pulled out to said body of the 1st equipment In case it is supported from the supporter formed in said body of the 1st equipment and said body of the 2nd equipment is pulled out to said body of the 1st equipment Image formation equipment characterized by for support by said supporter being canceled by operation of said first engagement means and a second engagement means, and said first development means and said second development means being pulled out by coincidence.
[Claim 6] Image-formation equipment according to claim 5 characterized by for said development door to support said first development means and a second development means where it opened said development door wide and said body of the 2nd equipment is pulled out to said body of the 1st equipment, when the development door is installed in said image formation equipment and said body of the 2nd equipment is pulled out to said body of the 1st equipment.
[Claim 7] Said image support is image formation equipment according to claim 5 or 6 characterized by being supported and pulled out by said body of the 2nd equipment in case it is in the condition that said body of the 2nd equipment is not pulled out to said body of the 1st equipment, and is supported by said body of the 1st

equipment and said body of the 2nd equipment is pulled out to said body of the 1st equipment.
[Claim 8] Said body of the 2nd equipment is image formation equipment according to claim 5, 6, or 7 characterized by a cash drawer being possible at the front-face side of equipment in which the control unit of said image formation equipment was installed to said body of the 1st equipment.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the image formation equipment which has a development means to develop with a developer the electrostatic latent image formed in the image support which forms an electrostatic latent image, and image support at least in more detail with respect to image formation equipment.
[0002]
[Description of the Prior Art]
(Prior art 1) Since it is generally short compared with the life cycle of image formation equipment, the life cycle of the development means used for image formation equipment must be exchanged if predetermined time use of the development means is carried out. Therefore, in consideration of exchange of a development means, it needed to determine that the structure of image formation equipment could carry out most easily, and various exchange was considered.
[0003] (Prior art 2) In order to make easy the processing of a paper jam and the consumer bull exchange of a development means which were generated inside equipment, what can open the imprint section of image formation equipment etc. is known.
[0004]
[Problem(s) to be Solved by the Invention] However, if yellow, a Magenta, cyanogen, and the development means of black consider the color picture formation equipment currently arranged in parallel and installed sequentially from a top among image formation equipment as a technical problem of (Prior art 1) Compared with the development means of black, the operating frequency of yellow and a Magenta development means etc. is low, since the life cycle is almost the same, they are constituted as one unit (henceforth a color development unit), and they have some which are exchanged in one.
[0005] If a color development unit is not made into structure which has the upper part of a color development unit in case it has and exchanges remarkable weight, it cannot have a color development unit by the stable force, and cannot perform exchange. Therefore, although the image-formation equipment which opens so that it may have the upper part of a color development unit can consider in case a color development unit exchanges, there are many by which a manuscript base, a toner supply unit, etc. are installed on the installed color development unit, and the structure which constitutes for the reasons of the precision over the body of equipment being required for a manuscript base, or a toner falling [a toner supply unit etc.] so that it may have the upper part of a color development unit is not desirable.
[0006] Then, although what pulls out and exchanges development means, such as a color development unit, for an equipment near side is desirable on the ease of exchange, and the structure of equipment, in order to perform exchange with the upper part of a color development unit, a color development unit must be supported in the pulled-out location. Although it is possible to install the susceptor supported in the location which pulled out the color development unit etc., if susceptor is separately prepared in the body of equipment, equipment causes enlargement and it is not desirable.
[0007] As a technical problem of (Prior art 2), in order to open the imprint section etc., the body of the 2nd equipment is pulled out to the body of the 1st equipment which makes the body principal part, and the image formation equipment in which two division is possible is known (Japanese-Patent-Application-No. No. 277978 [six to] official report etc.). Since considering the internal structure of image formation equipment driving sources, such as a development means and image support, are electrical parts, it is desirable to install in the

body of the 1st equipment with which the power source is arranged in consideration of wiring etc. On the other hand, in order to open the imprint section etc., as for image support and a development means, it is desirable to be pulled out with the body of the 2nd equipment.
[0008] However, since image support is stabilized, and has the driving force from a driving source supplied and it is necessary to perform image formation with good prevention for rotation nonuniformity to the minimum, it is desirable for a driving source to be supported by the body of the 1st equipment currently installed, and to set up distance with a driving source correctly, where the body of the 2nd equipment is set to the body of the 1st equipment.
[0009] Moreover, it is desirable to be supported by the body of the 1st equipment after the development means which needs a delicate location precision with image support has similarly set the body of the 2nd equipment to the body of the 1st equipment, and to set up distance with a driving source and image support correctly. Thus, in order to pull out the development means supported by the body of the 1st equipment with the body of the 2nd equipment, enlargement of equipment was not caused and image formation equipment of structure with easy actuation was desired.
[0010] It is in offering easily exchangeable image formation equipment, without preparing susceptor separately, in order that this invention may support, where it was made in view of the above-mentioned technical problem and the heavy development means of weight is pulled out as the 1st purpose. As the 2nd purpose, the cash-drawer equipment of the body of the 2nd equipment is interlocked with, two or more development means are pulled out, the imprint section of image formation equipment etc. is opened wide greatly, and it is in offering the image formation equipment which can make easy consumer bull exchange of processing of a paper jam, a development means, etc.
[0011]
[Means for Solving the Problem] The above-mentioned purpose is attained by the following means.
[0012] (1) In the image formation equipment which has at least the image support which forms an electrostatic latent image, and two or more development means to develop with a developer the electrostatic latent image formed in said image support It has an engagement means by which a first development means, the second development means installed in the lower part of said first development means, and said first development means and said second development means are engaged. In case a cash drawer is possible for said first development means and it pulls out said first development means to said image formation equipment, said second development means is pulled out by coincidence according to an operation of said engagement means. Image formation equipment characterized by said second development means supporting said first development means where said first development means is pulled out.
[0013] In the image formation equipment which has at least the image support which forms an electrostatic latent image, and two or more development means to develop with a developer the electrostatic latent image formed in said image support (2) -- [or] As opposed to the body of the 1st equipment with which the driving source was installed, and the body of the 1st equipment The body of the 2nd equipment in which a cash drawer is possible, The first development means in said two or more development means, and the second development means in said two or more development means, It has a first engagement means by which said first development means and said second development means are engaged, and a second engagement means to engage said first development means with said body of the 2nd equipment. Said first development means and a second development means In the condition that said body of the 2nd equipment is not pulled out to said body of the 1st equipment In case it is supported from the supporter formed in said body of the 1st equipment and said body of the 2nd equipment is pulled out to said body of the 1st equipment It is image formation equipment characterized by for support by said supporter being canceled by operation of said first engagement means and a second engagement means, and said first development means and said second development means being pulled out by coincidence.
[0014]
[Embodiment of the Invention] In advance of explanation of the operation gestalt of this invention, the equipment suitable for adoption of the image formation equipment of this invention is explained. Drawing 1 is the side elevation of the equipment suitable for adoption of the image formation equipment of this invention, and is the side elevation of the color printer which is image formation equipment in more detail.
[0015] This color printer is imprinted in the imprint section, after it lays each color toner image by which

sequential formation is carried out on top of image support, it is imprinted at once on a transfer paper P, it forms a color picture, and is color picture formation equipment of a method which exfoliates from an image formation side with a separation means after that.
[0016] By a diagram, the image support 42 is a photo conductor drum, and carries out spreading formation of the OPC photo conductor at a drum base. The scorotron electrification machine 61 is given with the grid and corona discharge wire which were held in uniform electrification of high potential to the peripheral surface of a photo conductor drum at grid potential. After being uniform charged to a photo conductor drum, image exposure based on a picture signal is performed by the image exposure means 63. The image exposure means 63 has an optical path bent by the reflective mirror 67 through the polygon mirror 64 and the ftheta lens 65 which rotate the laser diode which is not illustrated as the luminescence light source, and a cylindrical lens 66, horizontal scanning is made, and a latent image is formed of rotation of a photo conductor drum. There are yellow (Y), a Magenta (M), cyanogen (C), the Y development counter 52 that consisted of a black toner and a black (K) carrier, and contained 2 component developer, respectively, the M development counter 53, the C development counter 54, and a K development counter 56 in the periphery of the photo conductor drum 42.
[0017] First, the development of the yellow of one amorous glance builds in a magnet, and is performed by the development sleeve which is the developer support which holds a developer and rotates. The developer consists of a carrier and a toner. A developer is regulated by predetermined developer thickness and conveyed in a development region at the development sleeve 69 top. Spacing of the development sleeve 69 and the image support 42 in a development region is held at larger predetermined magnitude than developer thickness.
[0018] After development of one amorous glance finishes, it goes into the image formation process of the Magenta of two color planes. Image formation with the same still more nearly said of cyanogen and black is performed, and **** of four colors is formed in photo conductor drum lifting. On the other hand, the transfer paper P of one sheet discharged through the roller 70 for a half moon from the sheet paper cassette 72 stops near the resist roller 74 through the feed roller 71, and when the timing of an imprint is ready, it is fed to an imprint region by rotation actuation of the resist roller 74.
[0019] A multicolor image bundles up to the transfer paper P with which the pressure welding of the imprint means 62 was carried out to the peripheral surface of the photo conductor drum 42, and it was fed to it in the imprint region synchronizing with the timing of an imprint, and is imprinted. Subsequently, it dissociates from the peripheral surface of a photo conductor drum, and a transfer paper P is conveyed by the anchorage device 76. And after welding a toner by heating and pressurization, it is discharged by the paper output tray 78 of the equipment exterior through the delivery roller 77. On the other hand, after the photo conductor drum 42 which separated the transfer paper P receives electric discharge with an electric discharge vessel, it removes a residual toner with the pressure welding of the blade of cleaning equipment 79, and goes into the following process in response to electric discharge and electrification with the scorotron electrification machine 61 again.
[0020] Next, although the operation gestalt of the image formation equipment of this invention is explained, it is not limited to this. Drawing 2 is the side elevation of the image-formation equipment of an operation gestalt, drawing 3 is the perspective view of the first development means of the image-formation equipment of an operation gestalt, and a second development means, and, as for the condition that the first development means and the second development means are contained by image-formation equipment, and drawing 3 (b), drawing 3 (a) is [a first development means and the second development means of the condition currently pulled out from image-formation equipment, drawing 3 (c), and (d)] the actuation explanatory views of a second engagement means in more detail. Drawing 4 is the elevation of the first development means of an operation gestalt, and a second development means, drawing 5 is a side elevation in the condition that the first development means and the second development means were pulled out from the image formation equipment of an operation gestalt, and drawing 6 is a side elevation in the condition that the body of the 2nd equipment, the development means, and the photo conductor drum unit were pulled out from the image formation equipment of an operation gestalt.

[0021] Image formation equipment is constituted from drawing 2 , and 3 and 4 by the body 20 of the 1st equipment, and the body 30 of the 2nd equipment. The body 20 of the 1st equipment has the driving source which drives the development means 50 and which is not illustrated, the body rail 21 of the 1st equipment, the roller 23, the development door 25, and the support plate 24 grade.
[0022] The body rail 21 of the 1st equipment is a rail used as the guidance when pulling out the body 30 of the

2nd equipment, and the below-mentioned body arm 31 of the 2nd equipment moves it along with a rail. Moreover, the roller 23 is rotating the body arm 31 top of the 2nd equipment.

[0023] In case rotation with a shaft 26 is free for the development door 25 and it pulls out the body 30 of the 2nd equipment to the body 20 of the 1st equipment, it is opened. The body 30 of the 2nd equipment is supported by the back face 251, after, as for the development door 25, the first development means 51 and the second development means 55 have lapped in the condition of having been pulled out to the body 20 of the 1st equipment. Moreover, where the second development means 55 is pulled out, the development door 25 supports the second development means 55 by the back face 251. Moreover, there is a slot 221 in the support plate 22 fixed to the body 20 of the 1st equipment, the shaft 43 of the image support 42 engages with a slot 221, and the image support 42 is supported.

[0024] Next, the body 30 of the 2nd equipment is divided into the front-face side in which the control unit of image formation equipment was installed to the body 20 of the 1st equipment at an abbreviation horizontal, and a cash drawer is possible for it. The body arm 31 of the 2nd equipment and the slot 33 grade are prepared in the body 30 of the 2nd equipment.

[0025] Said body arm 31 of the 2nd equipment moves in a roller 23 top, the roller 32 further formed in the body arm 31 of the 2nd equipment moves along with the body rail 21 of the 1st equipment, and the body 30 of the 2nd equipment is pulled out at the front-face side of equipment. Moreover, the projection 311 for moving the photo conductor drum unit 41 to the body arm 31 of the 2nd equipment is formed. Moreover, a slot 33 is a slot prepared by fixing to the body 30 of the 2nd equipment, and the second engagement pin 571 of a second engagement means to mention later is engaged.

[0026] Next, the development means 50 develops with a developer the electrostatic latent image formed in the image support 42. Moreover, the development means 50 consists of second development means 55 installed in the lower part of the first development means 51 and said first development means.

[0027] The first development means 51 consists of the development counter frame 59, the Y development counter 52, an M development counter 53, a C development counter 54, and a second engagement means 57. The development counter frame 59 is a frame which has the Y development counter 52, the M development counter 53, the C development counter 54, and second engagement means 57 grade. The shell development means 51 is a development counter for colors, and can exchange now except a black development counter together. Moreover, in the condition that the shell development means 51 is not pulled out to the body 30 of the 2nd equipment, the shell development means 51 hangs and the member 511 is supported by the guide rail 80 of the body of the 2nd equipment possible [sliding] (drawing 4).

[0028] The Y development counter 52 in the development counter frame 59 is supported by the body 20 of the 1st equipment by pinching Y development counter supporter 524 installed in the body 20 of the 1st equipment between Y development projection upper part 522 and Y development counter projection lower part 523. Each development counter other than Y development counter 52 is similarly supported by the body of the 1st equipment.

[0029] On the second engagement lever 572 prepared in the first development means 51 as the body 30 of the 2nd equipment and the first development means 51 could be combined and separated now and it was shown in drawing 3 (c) and (d), the second engagement pin 571 has fixed said second engagement means 57. Moreover, the second engagement pin 571 engages with bearing 574 free [rotation], and can be moved now also in the vertical direction. The up tip of the second engagement pin 571 engages with the slot 33 of the body 30 of the 2nd equipment. The compression spring 573 is put in and included in the second engagement pin 571, and is energizing the second engagement lever 572 caudad. Moreover, there are L rabbit ears 513 and 514 in the first development means 51, and the second engagement lever 572 enters. Moreover, when the point of the second engagement pin 571 had projected like drawing 3 (a), the second engagement lever 572 became depressed, it goes into 513 sides, and when the point of the second engagement pin 571 has not projected like drawing 3 (b) on the other hand, the second engagement lever 572 becomes depressed and goes into 514 sides. If rotation actuation of the second engagement lever 572 is carried out in the direction of an arrow head 575 as shown in drawing 3 (c) and (d), the second engagement lever 572 will separate from the L rabbit ear 513, and will move in the direction of an arrow head 576 by energization of a compression spring 573. Then, the second engagement pin 571 descends and it separates from the slot 33 (drawing 2) of the body 30 of the 2nd equipment. Next, in order to make the tip of the second engagement pin 571 project To a compression spring

573, resist and the second engagement lever 572 is raised in an arrow head 576 and an opposite direction. If the direction and hard flow of an arrow head 575 are furthermore rotated, it becomes depressed and it puts into 513, it will be projected by the tip of the second engagement pin 571, and further, even if the second engagement lever 572 becomes depressed, is prevented by 513 and releases its hand, it comes to maintain the condition that the tip of the second engagement pin 571 projected.

[0030] Next, the second development means 55 consists of a K development counter 56 of a black developer, and first engagement means 58 grade. Since many [compared with the consumption of the developer of others / consumption / of a black developer], the K development counter 56 is formed alone.

[0031] The first engagement means 58 is engaged and can separate now the first development means 51 and the second development means 55. The first engagement means 58 abbreviates the same and detailed explanation to the above-mentioned second engagement means 57 structural and functionally. It engages with the slot 512 established in the shell development means 51, and the shell engagement pin 581 can be divided now into it.

[0032] Next, the photo conductor drum unit 41 is a unit which can be detached and attached and which has the image support 42 in drawing 6 , the image support 42 is being fixed to the support plate 44, and the image support 42 rotates the photo conductor drum unit 41 centering on a shaft 43. There is the stop section 441 in a support plate 44, and it is engaging with the projection 311 of the body arm 31 of the 2nd equipment. In case the body arm 31 of the 2nd equipment moves to the front-face side of equipment, the projection 311 prepared in the body arm 31 of the 2nd equipment pushes said stop section 441 in this direction. Moreover, migration of a support plate 44 also moves the photo conductor drum unit 41 currently supported by the support plate 44 in this direction. In the condition that the body 30 of the 2nd equipment is not pulled out to the body 20 of the 1st equipment, a shaft 43 goes into the support plate 22 of the body 30 of the 1st equipment, and the photo conductor drum unit 41 is supported. Moreover, in case the body 30 of the 2nd equipment is pulled out to the body 20 of the 1st equipment, the stop section 441 is supported by projection 311, and the photo conductor drum unit 41 is pulled out.

[0033] Here, each actual cash-drawer actuation is explained, respectively.

[0034] (A) If the development door 25 is opened in the direction of an arrow head 27 by cash-drawer actuation drawing 3 of the development means (the first, second development means) 50, and 5 and the second stop lever 572 is rotated to the front (it is arrow-head 575 direction at drawing 3), the second engagement pin 571 will fall according to the energization force of a compression spring 573. Then, engagement into the second engagement pin 571 and the slot 33 of the body 30 of the 2nd equipment which were established in the first development means 51 is solved. Here, the second stop lever 572 is grasped and it lengthens to the front-face side of equipment, and the first development means 51 hangs, a guide rail 80 is met and a member 511 is pulled out. Since the first engagement pin 581 is formed in the first development means 51 and is engaging with ****** 512 at this time, the second development means 55 is also pulled out by the cash drawer and coincidence of the first development means 51. The first development means 51 hangs at the last of a drawer, and a member 511 separates from a guide rail 80, and it is placed so that the first development means 51 may lap on the back face 251 of the development door 25 at the second development means 55. And if only the shell development means 51 is raised, the shell engagement pin 581 will separate from the slot 512 of the shell development means 51, and only the shell development means 51 will occur.

[0035] (B) If the development door 25 is opened by cash-drawer actuation drawing 2 of the second development means 55, and 3 and the first stop lever 582 is rotated to the front like the second stop lever 572, the first engagement pin 581 will fall according to the energization force of a compression spring. Then, engagement into the shell engagement pin 581 and the slot 512 (drawing 4 R> 4) of the shell development means 51 is solved. Here, the shell stop lever 582 is grasped, and it slides and pulls out to the front-face side of equipment at the back face 251 of the development door 25. In addition, the first development means 51 is hung and has structure which a member 511 goes into a guide rail 80, and does not require a load for the second development means 55.

[0036] (C) By cash-drawer actuation drawing 6 of the body 30 of the 2nd equipment, and the development means (the first, second development means) 50, open the development door 25 in the arrow-head 27 direction, and pull out the body 30 of the 2nd equipment to the front-face side of equipment (the direction of an arrow head 28). Then, the body arm 31 of the 2nd equipment of the body 30 of the 2nd equipment and one is also pulled out at the front-face side of equipment. In detail, the roller 32 which moved and was further formed in

the body arm 31 of the 2nd equipment rotates a roller 23 top along with the body rail 21 of the 1st equipment, the body arm 31 of the 2nd equipment moves, and the body 30 of the 2nd equipment is pulled out at the front-face side of equipment. In case the body of the 2nd equipment moves to the front-face side of equipment at this time, it moves also in the slot 33 currently fixed to the body of the 2nd equipment, and a slot 33 pushes the second engagement pin 571 in this direction. Then, if the first development means 51 moves and the first development means 51 moves, push and the second development means 55 will also be pulled out in this direction in the first engagement pin 581, and the slot 512 of the first development means 51 will be supported on the back face 251 of the development door 25 like a publication by said explanation (A) of operation.
[0037] Moreover, since Y development counter projection upper part 522 and Y development counter projection lower part 523 separate about support of a development counter from Y development counter supporter 524 installed in the body 30 of the 1st equipment, support of the Y development counter 52 is canceled. Support is similarly canceled for each development counters other than Y development counter 52.
[0038] (D) By cash-drawer actuation drawing 6 of the body 30 of the 2nd equipment, and the photo conductor drum unit 41, open the development door 25 in the arrow-head 27 direction, and pull out the body 30 of the 2nd equipment to the front-face side of equipment (the direction of an arrow head 28). Then, the body arm 31 of the 2nd equipment of the body 30 of the 2nd equipment and one is also pulled out at the front-face side of equipment. In detail, the roller 32 which moved and was further formed in the body arm 31 of the 2nd equipment rotates a roller 23 top along with the body rail 21 of the 1st equipment, the body arm 31 of the 2nd equipment moves, and the body 30 of the 2nd equipment is pulled out at the front-face side of equipment. In case the body arm 31 of the 2nd equipment moves to the front-face side of equipment at this time, the projection 311 prepared in the body arm 31 of the 2nd equipment pushes the stop section 441 prepared in the support plate 44 in this direction. Then, a support plate 44 moves, and the photo conductor drum unit 41 which has the image support 42 currently supported by the support plate 44 also moves in this direction, and is pulled out. In addition, in the condition that the body 30 of the 2nd equipment is not pulled out to the body 20 of the 1st equipment, the shaft 43 of the photo conductor drum unit 41 goes into the slot 221 of the support plate 22 of the body 30 of the 1st equipment, and the photo conductor drum unit 41 is supported. Moreover, in case the body 30 of the 2nd equipment is pulled out to the body 20 of the 1st equipment, the stop section 441 in which the photo conductor drum unit 41 was formed is supported by projection 311, and the photo conductor drum unit 41 is pulled out.
[0039]
[Effect of the Invention] Since it constituted as mentioned above, the following effectiveness is done so.
[0040] If according to invention of claim 1 a first development means is pulled out when there are a first development means for colors in a development means and a second development means for black and white, it is not necessary to newly install the member which can also pull out a second development means to coincidence, and supports a first development means, and a first development means can be supported, and exchange can be done easily that it is easy to grasp a development means.
[0041] According to invention of claim 2, only a second development means can be independently pulled out among two or more development means, and it is convenient.
[0042] According to invention of claim 3, separately, a second development means does not need to prepare susceptor in the body of equipment, can support it, and its structure is simple and it can achieve cost reduction-ization.
[0043] According to invention of claim 4, since it can pull out to the front-face side of image formation equipment, exchange becomes easy.
[0044] In order that the development means supported by the body of the 1st equipment may pull out with the body of the 2nd equipment according to invention of claim 5, enlargement of equipment is not caused and actuation becomes image formation equipment of easy structure.
[0045] according to invention of claim 6 -- separately -- susceptor -- the body of equipment -- it is not necessary to prepare -- structure -- it is simple and cost reduction-ization can be performed.
[0046] Since according to invention of claim 7 image support needs to stop rotation nonuniformity in response to the driving force from a driving source to the minimum and needs to perform image formation, where the body of the 2nd equipment is set to the body of the 1st equipment, a driving source is supported by the body of the 1st equipment currently installed, and can set up distance with a driving source correctly.

[0047] According to invention of claim 8, since it can pull out to the front-face side of image formation equipment, exchange becomes easy.

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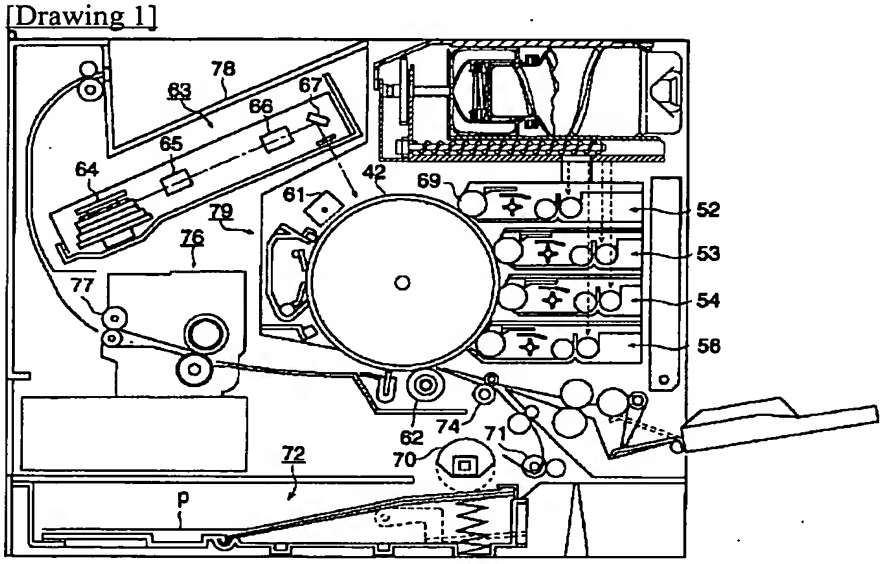
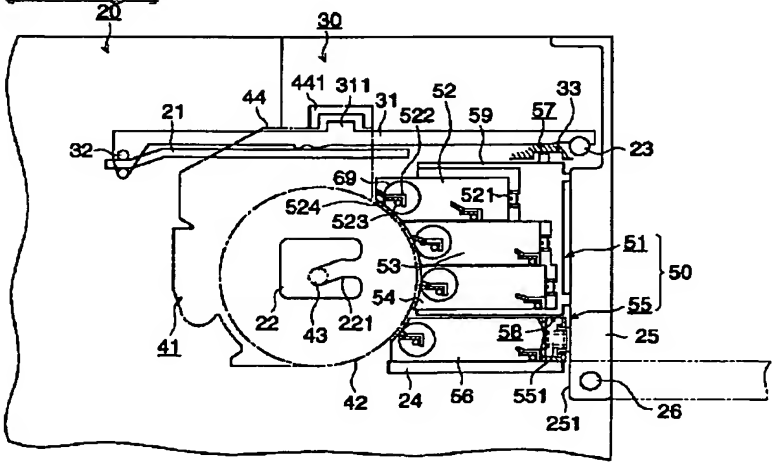
DRAWINGS

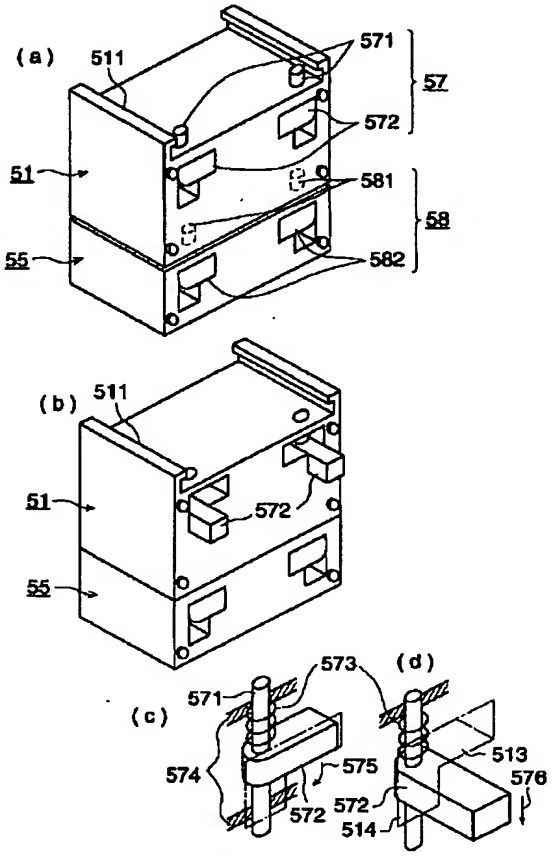
[Drawing 1]



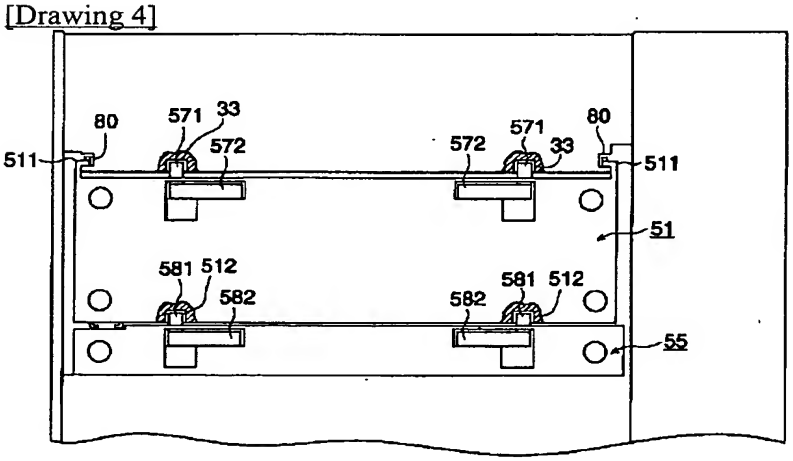
[Drawing 2]



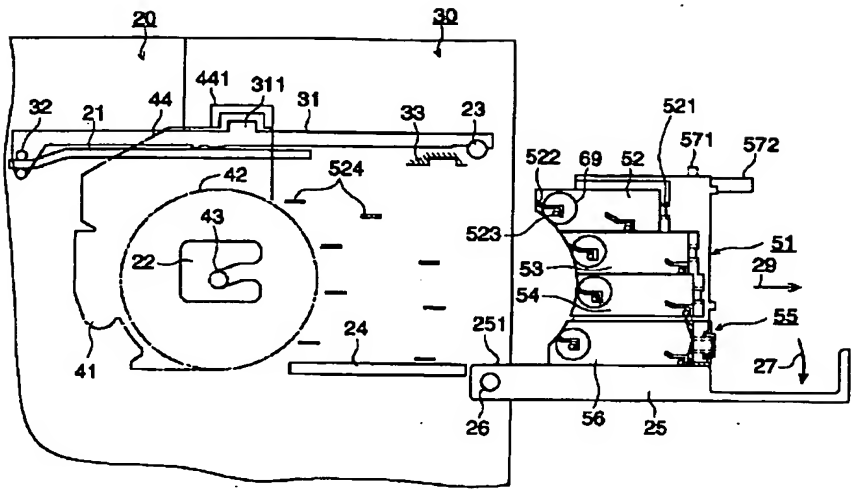
[Drawing 3]



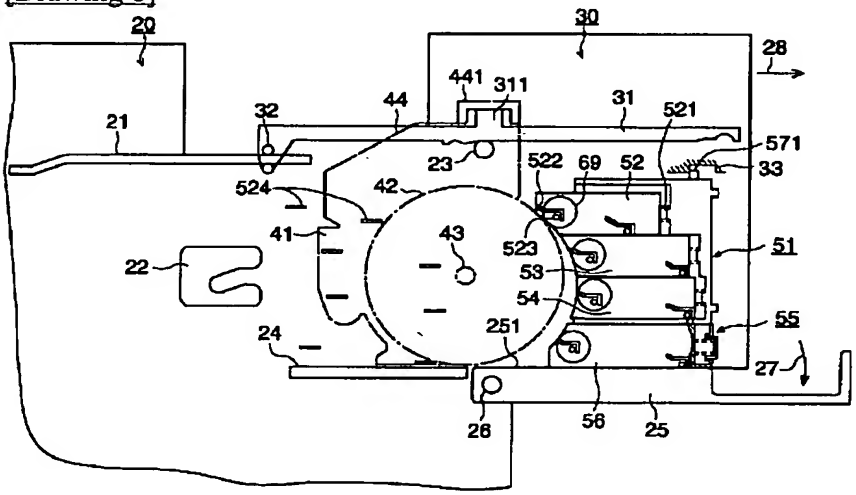
[Drawing 4]



[Drawing 5]



[Drawing 6]



[Translation done.]